4D107

000063295

Date: January 27, 1995

To: Peg Witherill, Kurt Muenchow

From: Paul Singh X3490

Subject: Analysis of OU7 Seep Data

cc: L N Klatt, ORNL

A preliminary analysis of the OU7 Seep Data (SW97) was performed to determine the best method for treatment of the water Since the source of the water is the landfill, water may be considered a listed waste under RCRA EG&G has proposed treating the water using a combination of OU2 and OU1 treatment facilities (Attachment 1) Although this option is viable, it may not be desirable Operation of the OU2 metals removal system will generate significant quantities of waste which will require disposal and data indicate that treatment for organics is not needed

Analysis of the volatile organics (benzene, methylene chloride, and vinyl chloride) data shows that it cannot be stated with certainty that the seep water is contaminated (Attachment 2) The levels of these compounds reported in the RFEDS data base are very close to the detection limits In addition, naphthalene is only detected at very low concentrations

Metals (barium, iron, manganese and zinc) are detected at levels higher than those usually encountered in groundwater The elevated level of metals is probably due to reducing conditions encountered in the landfill and presumably result from dissolution of soil minerals

The preferred option for handling the seep water is a proposal to EPA and CDPHE to delist the water (a mini risk assessment can be performed as was done on OU1 and OU2) and continue with the present monitoring effort The landfill pond provides a effective mechanism for removal of the metals (if the landfill pond is eliminated, an engineered wetland is preferable) If this option is rejected by the agencies, then it is desirable to send the water to the sewage treatment plant.

Attachment 1

isn't this our scope

EG&G ROCKY FLATS

INTEROFFICE CORRESPONDENCE

DATE. December 21, 1994

TO: M. C. Burmeister, EOM, Bldg. T891A, X5891

FROM L J Peterson-Wright, OU 5, 6, 7 Closures, Bldg. 080, X8553

SUBJECT OU7 PROPOSED PERFORMANCE STANDARDS - LJPW-025-94

DOE Order 4700.1

Action Review performance standards

Attached please find the OU 7 Proposed Performance Standards. These standards have been reviewed by the public and the regulatory agencies in the Proposed Action Memorandum The Proposed Action Memorandum was approved by the CDPHE on December 8, 1994.

Please review these performance standards with respect to the capability of OU 1, OU 2 and/or sitewide facility to treat the OU 7 effluent. Please respond at your earliest possible convenience.

I appreciate your assistance during the conceptual design phase of this project and I look forward to working with you during operation If you have any questions please call.

LJPW cb

Attachment
As Stated

SW97

Constituents	Ave Conc (µg/L)	Max Conc (µg/L)	OU7 Perfor-mance Standards (µg/L)	Reference	Comment
Antimony	22	60.4	14	5 CCR 1002-8 state standard drinking water	Standard 30-day average
Barium	640	1,550	1,000	5 CCR 1002-8 state standard human health, CWA-AWQC for protection of human health, water and fish ingestion	
Calcium	151,000	212,000	N/A		Nutrient species will not be considered for treatment
Iron	80,510	155,000	13,200	5 CCR 1002-8 Segment 5 standard. Temporary modification to Segment 5 until April 1, 1996	1,000 is a Segment 5 standard (Standard is for 1-day)
Lithium	48	107	1,000		No federal or state surface or water quality standards exist. Suggest a value of 1,000 as 10 times the CLP Detection Limit
Magnesium	34,719	49,000			Nutrient species will not be considered for treatment
Manganese	1,611	2,490	1,000	Segment 4 and 5 Standard	Standard is 30-day average
Potassium	6,436	11,700			Nutrient species will not be considered for treatment

Silicon	13,508	44,000			Nutrient species will not be considered for treatment
Sodium	71,367	110,000			Nutrient species will not be considered for treatment
Strontium	919	1,370	2,000		No federal or state surface or water quality standards exist. Suggest a value of 2,000 as 10 times the CLP Detection Limit
Tin	67	306	1,000		No federal or state surface or water quality standards exist Suggest a value of 1,000 as 10 times the CLP Detection Limit
Zinc	2,945	16,000	350	350 µg/L is Segment 5 standard 350 µg/L is the temporary modification to Segment 5 until April 1, 1996.	2,000 µg/L is WQCC basic surface water standard for agriculture (30-day average)
Gross Beta	11	17	4 mrem/year	SDWA MCL	mrem/yr
Strontium-89/90	1.3	4 06	8	SDWA MCL	
Tritium	349	1,500	1,000	DOE DCG value	
Uranium-235	0 1	0 7	600	DOE DCG value	
Nitrite	30 33	63	500	5 CCR 1002-8 Segment 4 and 5 standard	Standard is 1-day
1,1-Dichloroethane	6	10	59	6 CCR 1007-3, Section 268 43	
2-Butanone	12	76	280	6 CCR 1007-3, Section 268 43	

2-Hexanone	5	10	100		No Federal I or State surface or water quality standards exist Suggest a value of 100 as 10 times the CLP Detection Limit
4-Methyl-2-pentanone	11	87	140	6 CCR 1007-3 Section 268.43	
Acetone	33	220	280	6 CCR 1007-3 Section 268 43	
Benzene	2	5	1	5 CCR 1002-8, State Standard for Water Supply	
Carbon Disulfide	3	6	14	5 CCR 1002-8, State Standard for Water Supply	
Chloroethane	22	57	270	6 CCR 1007-3 Section 268 43	
Chloromethane	5	10	190	5 CCR 1002-8, State Standard for Water and FishSupply	
Ethylbenzene	13	18	680	5 CCR 1002-8, State Standard for Water Supply	
Methylene Chloride	14	190	4 7	5 CCR 1002-8,Segment 4 and 5 standard	
Tetrachloroethane	2	5	1	5 CCR 1002-8, 3 1 11 PQL	
Toluene	38	88	1000	SDWA MCL	
Total Xylenes	14	25	10,000	SDWA MCL	
Trichloroethene	2	5	66	5 CCR 1002-8, Segment 5 standard. Temporary modification to Segment 5 until April 1, 1996	5 µg/L=5 CCR 1002-8, State standard for water supply

Vinyl Acetate	7	49	500		No federal or state surface or water quality standards exist Suggest a value of 500 as 10 times the Method 8240 Detection Limit
Vinyl Chloride	5	11	2	5 CCR 1002-8, State Standard for Water Supply	
2,4-Dimethylphenol	5	10	2,120	5 CCR 1002-8 State Standard for Aquatic Life	Acute Value
2-Methylnapthalene	16	23	100		Not listed in 40 CFR 302 4 or 6 CCR 1007-3 Pt 261 Appendix VII Suggest a value of 100 as 10 times the CLP Detection Limit
4-Methylphenol	4	10	100		Not listed in 40 CFR 302 4 or 6 CCR 1007-3 Pt 261 Appendix VII Suggest a value of 100 as 10 times the CLP Detection Limit (Note PPRG for residential surface water swimming is 140 mg/L)
Acenapthene	3	3	10	5 CCR 1002-8, 3 1 11 PQL	0 0028 is Segment 4 and 5 standard
Bis(2-ethylhexyl) phthalate	5	12	10	5 CCR 1002-8 3 1.11 PQL	1 8 = WQCC basic surface water standard

Dibenzofuran	1	2	10		Not listed in 40 CFR 302 4 or 6 CCR 1007-3 Pt 261 Appendix VII Suggest a values of 100 as 10 times the CLP Detection Limit
Diethyl Phthalate	3	10	23,000	5 CCR 1002-8, State Standard for Water and Fish	
Fluorene	2	3	10	5 CCR 1002-8, 3.1.11 PQL	0.0028 is Segment 4 and 5 standard
Napthalene	18	22	10	5 CCR 1002-8, 3.1 11 PQL	0 0028 is Segment 4 and 5 standard
Phenanthrene	4	5	10	5 CCR 1002-8, 3 1 11 PQL	0 0028 is Segment 4 and 5 standard

Attachment 2

Methylene Chloride

The data for methylene chloride is given in Table 2-1 and shown graphically in Figure 2-1 The data prior to 1990 should be used with caution since the QA/QC was lacking The remaining data show three elevated readings and each has a "B" qualifier This indicates that methylene chloride was also detected in the blank thus making the data highly questionable It is recommended these value not be used in the determining contamination

Benzene

The data for benzene is given in Table 2-2 and shown graphically in Figure 2-2 All data are at or below the detection limit It cannot be said with certainty that benzene is even present in the water

Vinyl Chloride

The data for vinyl chloride is given in Table 2-3 and shown graphically in Figure 2-3 Only one data point is above the detection limit This data is from samples collected prior to 1990 and is shown with a "J" qualifier which means it is an estimated value

Naphthalene

The data for naphthalene is given in Table 2-4 and shown graphically in Figure 2-4 Naphthalene is detected in enough samples to indicate that it is probably real The levels detected are rather low

Antimony

The data for antimony is given in Table 2-5 and shown graphically in Figure 2-5 The numbers reported for antimony are very close the detection limit It is not certain if antimony contamination exists The readings may be due to naturally occurring minerals

TABLE 2-1

SW097	SW70046ST	SW	REAL	SW70050ST	24 Mar 93	VOA8240	TRG	METHYLENE CHLORID		7	UG/L		U	5	JA	49
SW097	SW88A001	SW	REAL		16 Jun 88	VOACLP	TRG	METHYLENE CHLORID		13	UG/L			5		
SW097	SW0979000	SW	REAL		6 Apr 89	VOACLP	TRG	METHYLENE CHLORID		3	UG/L		J	5	A	
SW097	SW097002	SW	REAL		19 May 89	VOACLP	TRG	METHYLENE CHLORID		15	UG/L		UJ	5	A	
SW097	SW097003	SW	REAL		20 Jun 89	VOACLP	TRG	METHYLENE CHLORID		15	UG/L			5	V	
SW097	SW097004	SW	REAL		7 Jul 89	VOACLP	TRG	METHYLENE CHLORID		2	UG/L		J	5		
SW097	SW097005	SW	REAL		2 Aug 89	VOACLP	TRG	METHYLENE CHLORID		6	UG/L		UJ	5	A	
SW097	SW097007	SW	REAL		9 Oct 89	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		UJ	5	A	
SW097	SW097008	SW	REAL		7 Nov 89	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		UJ	5	A	
SW097	SW097009	SW	REAL		5 Dec 89	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5	V	
SW097	SW0979000	SW	REAL		12 Jan 90	VOACLP	TRG	METHYLENE CHLORID		4	UG/L		J	5	A	
SW097	SW0979000	SW	REAL		13 Feb 90	VOACLP	TRG	METHYLENE CHLORID		190	UG/L		B	5		
SW097	SW0979000	SW	REAL		23 Mar 90	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5	V	
SW097	SW097W05	SW	REAL		3 May 90	VOACLP	TRG	METHYLENE CHLORID		3	UG/L		JB	5		
SW097	SW097W06	SW	REAL	SW097W06	5 Jun 90	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		B	5		
SW097	SW00500W	SW	REAL	SW00500W	6 Jul 90	VOACLP	TRG	METHYLENE CHLORID		3	UG/L		JB	5		
SW097	SW00500W	SW	TB	SW00500W	6 Jul 90	VOACLP	TRG	METHYLENE CHLORID		3	UG/L		JB	5		
SW097	SW00211W	SW	REAL	SW00211W	2 Aug 90	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		B	5		
SW097	SW00289W	SW	REAL	SW00289W	6 Sep 90	VOACLP	TRG	METHYLENE CHLORID		10	UG/L		B	5		
SW097	SW00370W	SW	REAL	SW00370W	4 Oct 90	VOACLP	TRG	METHYLENE CHLORID		7	UG/L		U		JA	49
SW097	SW00471W	SW	REAL	SW00471W	13 Nov 90	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5	JA	
SW097	SW00567W	SW	REAL	SW00575W	3 Dec 90	VOACLP	TRG	METHYLENE CHLORID		2	UG/L		J		A	
SW097	SW00986W	SW	REAL	SW00986W	3 Apr 91	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5		
SW097	SW01093W	SW	REAL	SW01093W	2 May 91	VOACLP	TRG	METHYLENE CHLORID		3	UG/L		J	5		
SW097	SW01093W	SW	REAL	SW01093W	2 May 91	VOACLP	TRG	METHYLENE CHLORID		3	UG/L		J	5		
SW097	SW01196W	SW	REAL	SW01196W	19 Jun 91	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5		
SW097	SW80136W	SW	RNS	SW01196W	19 Jun 91	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5		
SW097	SW80137W	SW	DUP	SW01196W	19 Jun 91	VOACLP	TRG	METHYLENE CHLORID		4	UG/L		J	5		
SW097	SW01299W	SW	REAL	SW01299W	29 Jul 91	VOACLP	TRG	METHYLENE CHLORID		6	UG/L		B	5		
SW097	SW80143W	SW	DUP	SW01299W	29 Jul 91	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		B	5		
SW097	SW80142W	SW	RNS	SW01299W	29 Jul 91	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5		
SW097	SW01405W	SW	REAL	SW01405W	28 Aug 91	VOACLP	TRG	METHYLENE CHLORID		6	UG/L		U	5	JA	49
SW097	SW80153W	SW	DUP	SW01405W	28 Aug 91	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5	JA	49
SW097	SW80152W	SW	RNS	SW01405W	28 Aug 91	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5	JA	
SW097	SW01511W	SW	REAL	SW01511W	25 Sep 91	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5	V	
SW097	SW01617W	SW	REAL	SW01617W	9 Oct 91	VOACLP	TRG	METHYLENE CHLORID		37	UG/L		U	5	JA	49
SW097	SW01617W	SW	REAL	SW01617W	9 Oct 91	VOACLP	TRG	METHYLENE CHLORID		37	UG/L		B	5		
SW097	SW70023ST	SW	REAL		17 Dec 92	VOACLP	TRG	METHYLENE CHLORID		4	UG/L		J	5	A	
SW097	SW70026ST	SW	REAL	SW70027ST	25 Jan 93	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5	V	
SW097	SW70027ST	SW	RNS	SW70026ST	25 Jan 93	VOACLP	TRG	METHYLENE CHLORID		5	UG/L		U	5	V	
SW097	SW70031ST	SW	RNS	SW70030ST	26 Feb 93	VOACLP	TRG	METHYLENE CHLORID		5	UG/L			5	V	
SW097	SW70030ST	SW	REAL	SW70031ST	26 Feb 93	VOACLP	TRG	METHYLENE CHLORID		9	UG/L		U	5	JA	49
SW097	SW70046ST	SW	REAL	SW70050ST	24 Mar 93	VOACLP	TRG	METHYLENE CHLORID		7	UG/L		U	5	JA	49

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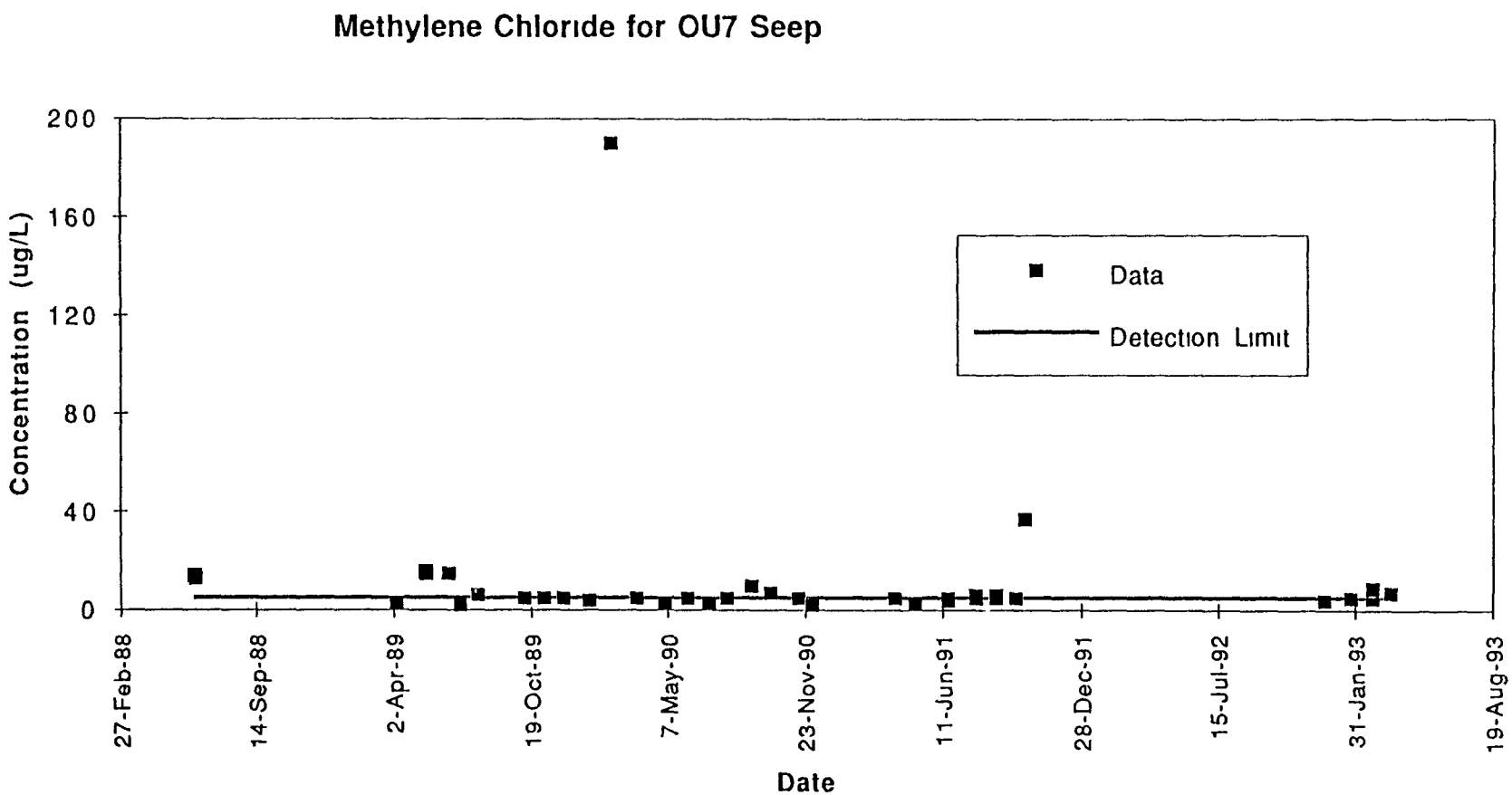
Methylene Chloride for OU7 Seep
Concentration (ug/L)
200
160
120
80
40
0
Data
Detection Limit
27-Feb-88
14-Sep-88
2-Apr-89
19-Oct-89
7-May-90
23-Nov-90
11-Jun-91
28-Dec-91
15-Jul-92
31-Jan-93
19-Aug-93
Date

FIG 2-1

TABLE 2-2

SW097	SW70046ST	SW	REAL	SW70050ST	24 Mar 93	VOA8240	TRG	BENZENE		5	UG/L		U	5	V	
SW097	SW88A001	SW	REAL		16 Jun 88	VOACLP	TRG	BENZENE		5	UG/L		U	5		
SW097	SW0979000	SW	REAL		6 Apr 89	VOACLP	TRG	BENZENE		2	UG/L		J	5	A	
SW097	SW097002	SW	REAL		19 May 89	VOACLP	TRG	BENZENE		1	UG/L		J	5	A	
SW097	SW097003	SW	REAL		20 Jun 89	VOACLP	TRG	BENZENE		5	UG/L		UJ	5	A	
SW097	SW097004	SW	REAL		7 Jul 89	VOACLP	TRG	BENZENE		5	UG/L		U	5		
SW097	SW097005	SW	REAL		2 Aug 89	VOACLP	TRG	BENZENE		5	UG/L		U	5	V	
SW097	SW097007	SW	REAL		9 Oct 89	VOACLP	TRG	BENZENE		5	UG/L		UJ	5	A	
SW097	SW097008	SW	REAL		7 Nov 89	VOACLP	TRG	BENZENE		5	UG/L		UJ	5	A	
SW097	SW097009	SW	REAL		5 Dec 89	VOACLP	TRG	BENZENE		5	UG/L		UJ	5	A	
SW097	SW0979000	SW	REAL		12 Jan 90	VOACLP	TRG	BENZENE		5	UG/L		U	5	V	
SW097	SW0979000	SW	REAL		13 Feb 90	VOACLP	TRG	BENZENE		5	UG/L		U	5		
SW097	SW0979000	SW	REAL		23 Mar 90	VOACLP	TRG	BENZENE		1	UG/L		J	5	A	
SW097	SW097W05	SW	REAL		3 May 90	VOACLP	TRG	BENZENE		1	UG/L		J	5		
SW097	SW097W06	SW	REAL	SW097W06	5 Jun 90	VOACLP	TRG	BENZENE		2	UG/L		J	5		
SW097	SW00500W	SW	REAL	SW00500W	6 Jul 90	VOACLP	TRG	BENZENE		1	UG/L		J	5		
SW097	SW00500W	SW	TB	SW00500W	6 Jul 90	VOACLP	TRG	BENZENE		5	UG/L		U	5		
SW097	SW00211W	SW	REAL	SW00211W	2 Aug 90	VOACLP	TRG	BENZENE		1	UG/L		J	5		
SW097	SW00289W	SW	REAL	SW00289W	6 Sep 90	VOACLP	TRG	BENZENE		1	UG/L		J	5		
SW097	SW00370W	SW	REAL	SW00370W	4 Oct 90	VOACLP	TRG	BENZENE		2	UG/L		J		A	
SW097	SW00471W	SW	REAL	SW00471W	13 Nov 90	VOACLP	TRG	BENZENE		1	UG/L		J	5	A	
SW097	SW00567W	SW	REAL	SW00575W	3 Dec 90	VOACLP	TRG	BENZENE		1	UG/L		J		A	
SW097	SW00986W	SW	REAL	SW00986W	3 Apr 91	VOACLP	TRG	BENZENE		2	UG/L		J	5		
SW097	SW01093W	SW	REAL	SW01093W	2 May 91	VOACLP	TRG	BENZENE		5	UG/L		U	5		
SW097	SW01093W	SW	REAL	SW01093W	2 May 91	VOACLP	TRG	BENZENE		5	UG/L		U	5		
SW097	SW01196W	SW	REAL	SW01196W	19 Jun 91	VOACLP	TRG	BENZENE		5	UG/L		U	5		
SW097	SW80136W	SW	RNS	SW01196W	19 Jun 91	VOACLP	TRG	BENZENE		5	UG/L		U	5		
SW097	SW80137W	SW	DUP	SW01196W	19 Jun 91	VOACLP	TRG	BENZENE		5	UG/L		U	5		
SW097	SW01299W	SW	REAL	SW01299W	29 Jul 91	VOACLP	TRG	BENZENE		2	UG/L		J	5		
SW097	SW80143W	SW	DUP	SW01299W	29 Jul 91	VOACLP	TRG	BENZENE		2	UG/L		J	5		
SW097	SW80142W	SW	RNS	SW01299W	29 Jul 91	VOACLP	TRG	BENZENE		5	UG/L		U	5		
SW097	SW01405W	SW	REAL	SW01405W	28 Aug 91	VOACLP	TRG	BENZENE		2	UG/L		J	5	A	
SW097	SW80153W	SW	DUP	SW01405W	28 Aug 91	VOACLP	TRG	BENZENE		2	UG/L		J	5	A	
SW097	SW80152W	SW	RNS	SW01405W	28 Aug 91	VOACLP	TRG	BENZENE		5	UG/L		U	5	V	
SW097	SW01511W	SW	REAL	SW01511W	25 Sep 91	VOACLP	TRG	BENZENE		5	UG/L		U	5	V	
SW097	SW01617W	SW	REAL	SW01617W	9 Oct 91	VOACLP	TRG	BENZENE		5	UG/L		U	5	V	
SW097	SW70023ST	SW	REAL		17 Dec 92	VOACLP	TRG	BENZENE		1	UG/L		J	5	A	1
SW097	SW70026ST	SW	REAL	SW70027ST	25 Jan 93	VOACLP	TRG	BENZENE		5	UG/L		U	5	V	
SW097	SW70027ST	SW	RNS	SW70026ST	25 Jan 93	VOACLP	TRG	BENZENE		5	UG/L		U	5	V	
SW097	SW70031ST	SW	RNS	SW70030ST	26 Feb 93	VOACLP	TRG	BENZENE		5	UG/L		U	5	V	
SW097	SW70030ST	SW	REAL	SW70031ST	26 Feb 93	VOACLP	TRG	BENZENE		5	UG/L		U	5	V	
SW097	SW70046ST	SW	REAL	SW70050ST	24 Mar 93	VOACLP	TRG	BENZENE		5	UG/L		U	5	V	

Benzene Concentration for OU7 Seep

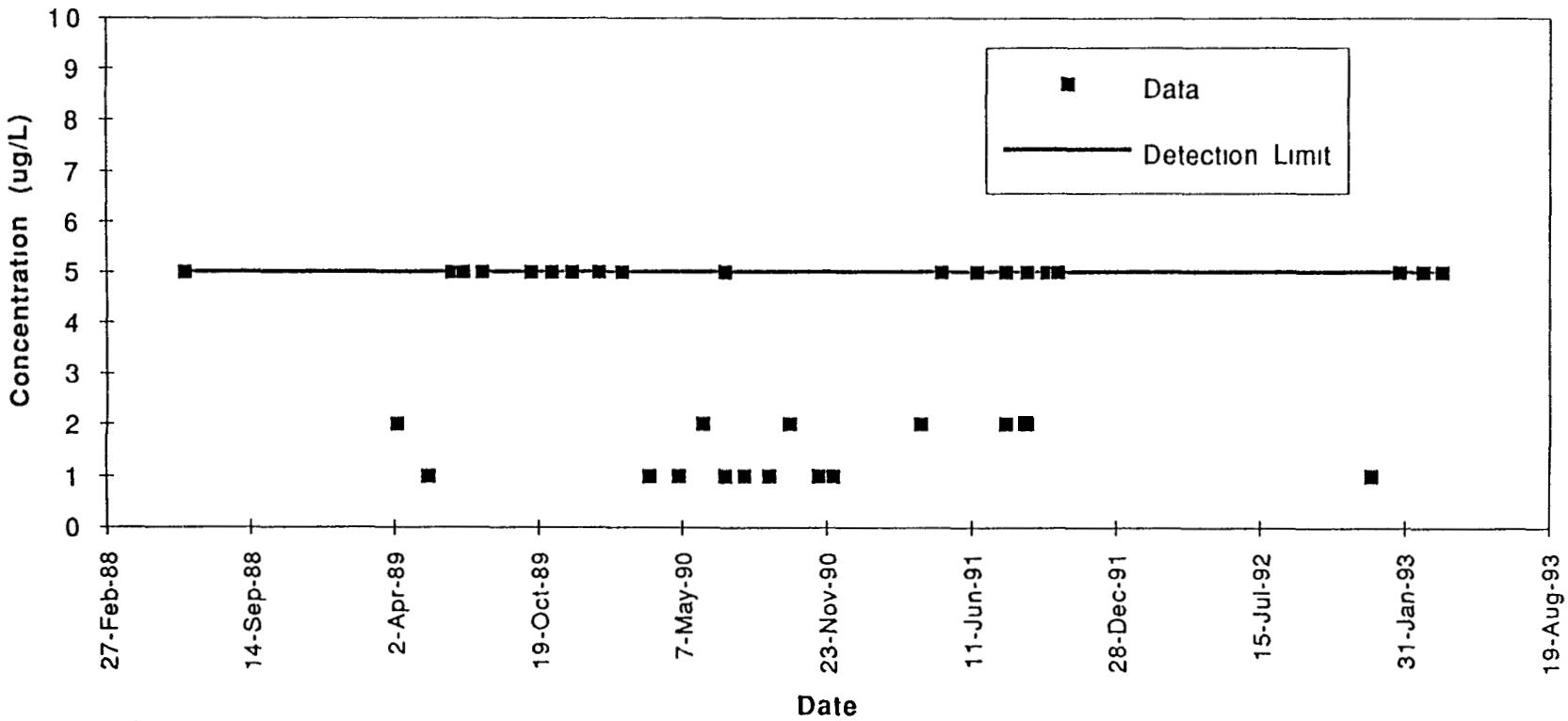

FIG 2-2

TABLE 2-3

SW097	SW70046ST	SW	REAL	SW70050ST	24 Mar 93	VOA8240	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW88A001	SW	REAL		16 Jun 88	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW0979000	SW	REAL		6 Apr 89	VOACLP	TRG	VINYL CHLORIDE		30	UG/L		J	10	A	
SW097	SW097002	SW	REAL		19 May 89	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		UJ	10	A	
SW097	SW097003	SW	REAL		20 Jun 89	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW097004	SW	REAL		7 Jul 89	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW097005	SW	REAL		2 Aug 89	VOACLP	TRG	VINYL CHLORIDE		2	UG/L		J	10	V	
SW097	SW097007	SW	REAL		9 Oct 89	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		UJ	10	A	
SW097	SW097008	SW	REAL		7 Nov 89	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW097009	SW	REAL		5 Dec 89	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW0979000	SW	REAL		12 Jan 90	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW0979000	SW	REAL		13 Feb 90	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW0979000	SW	REAL		23 Mar 90	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW097W05	SW	REAL		3 May 90	VOACLP	TRG	VINYL CHLORIDE		4	UG/L		J	10		
SW097	SW097W06	SW	REAL	SW097W06	5 Jun 90	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW00500W	SW	TB	SW00500W	6 Jul 90	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW00500W	SW	REAL	SW00500W	6 Jul 90	VOACLP	TRG	VINYL CHLORIDE		5	UG/L		J	10		
SW097	SW00211W	SW	REAL	SW00211W	2 Aug 90	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW00289W	SW	REAL	SW00289W	6 Sep 90	VOACLP	TRG	VINYL CHLORIDE		3	UG/L		J	10		
SW097	SW00370W	SW	REAL	SW00370W	4 Oct 90	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U		V	
SW097	SW00471W	SW	REAL	SW00471W	13 Nov 90	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW00567W	SW	REAL	SW00575W	3 Dec 90	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U		V	
SW097	SW00986W	SW	REAL	SW00986W	3 Apr 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW01093W	SW	REAL	SW01093W	2 May 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW01093W	SW	REAL	SW01093W	2 May 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW01196W	SW	REAL	SW01196W	19 Jun 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW80136W	SW	RNS	SW01196W	19 Jun 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW80137W	SW	DUP	SW01196W	19 Jun 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW01299W	SW	REAL	SW01299W	29 Jul 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW80142W	SW	RNS	SW01299W	29 Jul 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW80143W	SW	DUP	SW01299W	29 Jul 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW01405W	SW	REAL	SW01405W	28 Aug 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10		
SW097	SW80152W	SW	RNS	SW01405W	28 Aug 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW80153W	SW	DUP	SW01405W	28 Aug 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW01511W	SW	REAL	SW01511W	25 Sep 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW01617W	SW	REAL	SW01617W	9 Oct 91	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW70023ST	SW	REAL		17 Dec 92	VOACLP	TRG	VINYL CHLORIDE		8	UG/L		J	10	A	
SW097	SW70026ST	SW	REAL	SW70027ST	25 Jan 93	VOACLP	TRG	VINYL CHLORIDE		11	UG/L			10	V	
SW097	SW70027ST	SW	RNS	SW70026ST	25 Jan 93	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW70031ST	SW	RNS	SW70030ST	26 Feb 93	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW70030ST	SW	REAL	SW70031ST	26 Feb 93	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	
SW097	SW70046ST	SW	REAL	SW70050ST	24 Mar 93	VOACLP	TRG	VINYL CHLORIDE		10	UG/L		U	10	V	

Vinyl Chloride Concentration for OU7 Seep

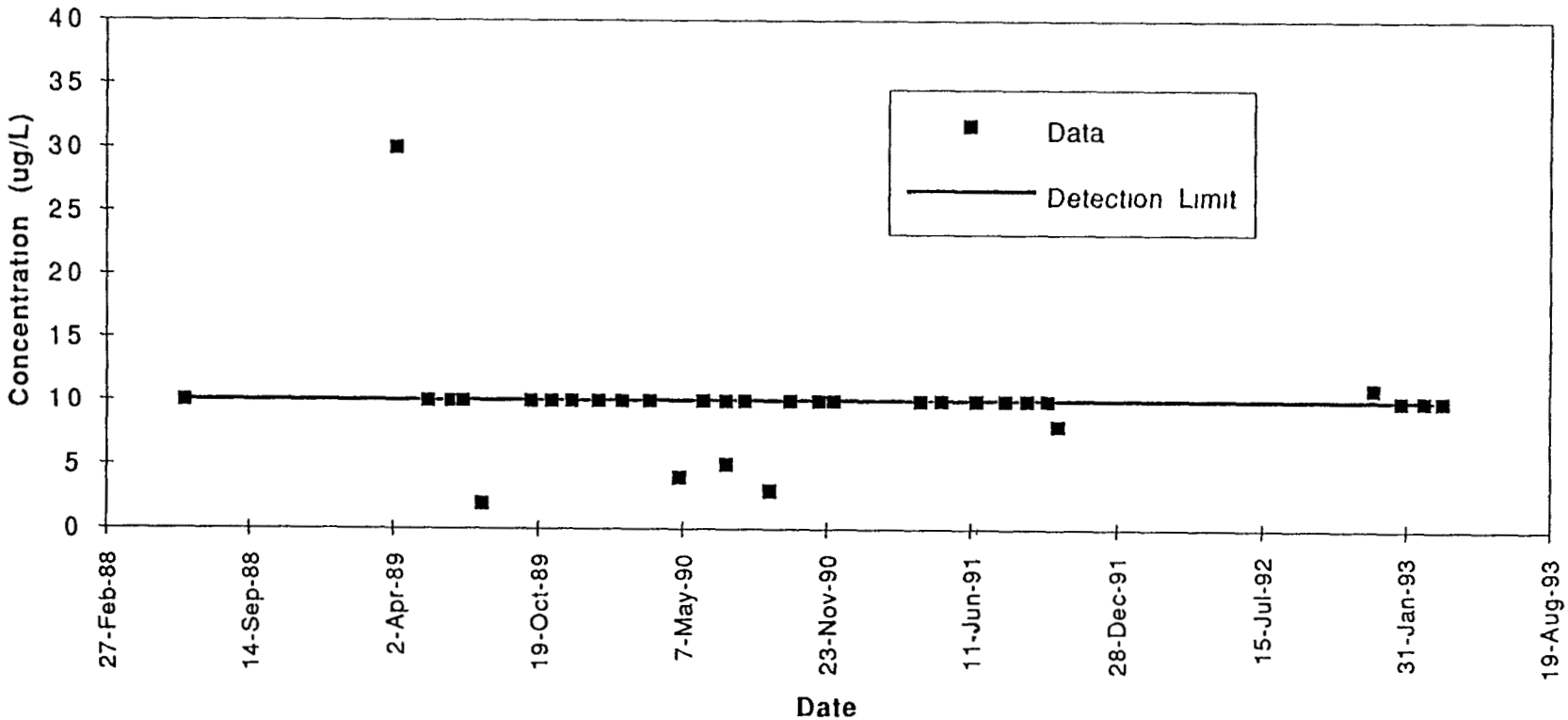

FIG 2-3

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TABLE 2-4

SW097	SW09790000	SW	REAL		6 Apr 89	BNACLP	TRG	NAPHTHALENE		9	UG/L		J	10	A		
SW097	SW097002	SW	REAL		19 May 89	BNACLP	TRG	NAPHTHALENE		10	UG/L			10	A		
SW097	SW097007	SW	REAL		9 Oct 89	BNACLP	TRG	NAPHTHALENE		6	UG/L		J	10	A		
SW097	SW00370W	SW	REAL	SW00370W	4 Oct 90	BNACLP	TRG	NAPHTHALENE		26	UG/L				V		
SW097	SW00986W	SW	REAL	SW00986W	3 Apr 91	BNACLP	TRG	NAPHTHALENE		14	UG/L			10			
SW097	SW01617W	SW	REAL	SW01617W	9 Oct 91	BNACLP	TRG	NAPHTHALENE		22	UG/L			10	V		
SW097	SW70024ST	SW	REAL		17 Dec 92	BNACLP	TRG	NAPHTHALENE		19	UG/L			10	JA	42	
SW097	SW70024ST	SW	REAL		17 Dec 92	BNACLP	REX	NAPHTHALENE		10	UG/L		J	12			
SW097	SW70026ST	SW	REAL	SW70027ST	25 Jan 93	BNACLP	TRG	NAPHTHALENE		14	UG/L			10	V		
SW097	SW70027ST	SW	RNS	SW70026ST	25 Jan 93	BNACLP	TRG	NAPHTHALENE		10	UG/L		U	10	V		
SW097	SW70031ST	SW	RNS	SW70030ST	26 Feb 93	BNACLP	TRG	NAPHTHALENE		7	UG/L		U	7	V		
SW097	SW70030ST	SW	REAL	SW70031ST	26 Feb 93	BNACLP	REX	NAPHTHALENE		7	UG/L		J	10			
SW097	SW70030ST	SW	REAL	SW70031ST	26 Feb 93	BNACLP	TRG	NAPHTHALENE		20	UG/L			10	JA	42	
SW097	SW70046ST	SW	REAL	SW70050ST	24 Mar 93	BNACLP	TRG	NAPHTHALENE		25	UG/L			10	JA	42	
SW097	SW09790000	SW	REAL		6 Apr 89	BNACLP	TRG	NITROBENZENE		10	UG/L		U	10	R		

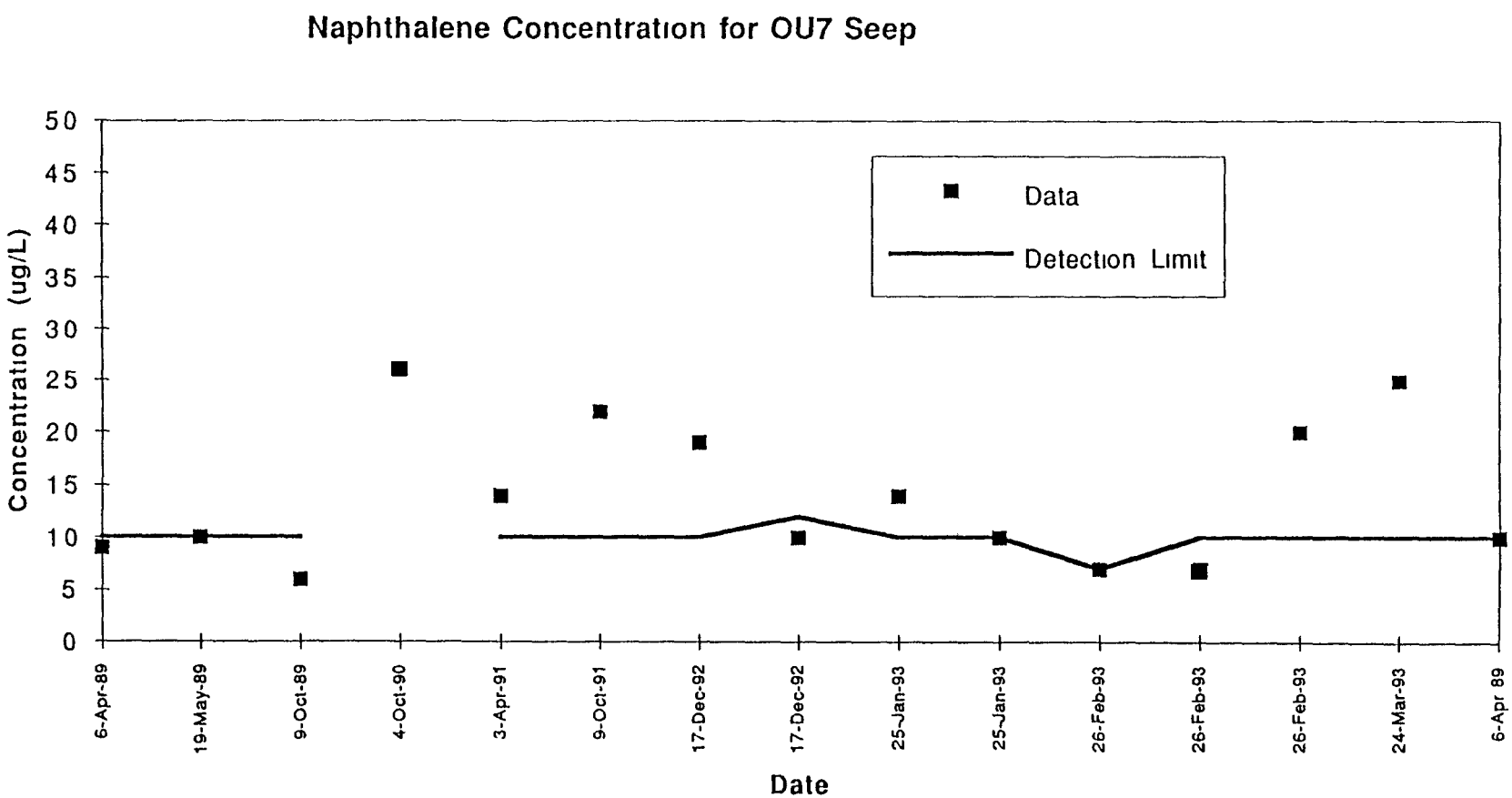
Naphthalene Concentration for OU7 Seep
Concentration (ug/L)
50
45
40
35
30
25
20
15
10
5
0
Data
Detection Limit
6-Apr-89
19-May-89
9-Oct-89
4-Oct-90
3-Apr-91
9-Oct-91
17-Dec-92
17-Dec-92
25-Jan-93
25-Jan-93
26-Feb-93
26-Feb-93
26-Feb-93
24-Mar-93
6-Apr 89
Date

FIGURE 2-4

TABLE 2-5

Location	Sample Number	Type		QA Sample Number	Date Collected	Analyte Group	?	Compound	Result	Units	Qualifier	Detect Lim	Validation	
SW097	SW88A001	SW	REAL		16 Jun 88	TMetals	TRG	ANTIMONY	60	MG/L	U			
SW097	SW0979000	SW	REAL		6 Apr 89	TMetals	TRG	ANTIMONY	18 6	UG/L	UJ	60	A	
SW097	SW097002	SW	REAL		19 May 89	TMetals	TRG	ANTIMONY	27 2	UG/L	UJ	60	A	
SW097	SW097003	SW	REAL		20 Jun 89	TMetals	TRG	ANTIMONY	28 9	UG/L	U	60	V	
SW097	SW097004	SW	REAL		7 Jul 89	TMetals	TRG	ANTIMONY	24 4	UG/L	U	60	V	
SW097	SW097005	SW	REAL		2 Aug 89	TMetals	TRG	ANTIMONY	24 4	UG/L	UJ	60	A	
SW097	SW097007	SW	REAL		9 Oct 89	TMetals	TRG	ANTIMONY	33 1	UG/L	UJ	60	A	
SW097	SW097009	SW	REAL		5 Dec 89	TMetals	TRG	ANTIMONY	34 5	UG/L	UJ	60	A	
SW097	SW0979000	SW	REAL		12 Jan 90	TMetals	TRG	ANTIMONY	0 5	MG/L	U	500		
SW097	SW0979000	SW	REAL		13 Feb 90	TMetals	TRG	ANTIMONY	60	UG/L	U	60		
SW097	SW0979000	SW	REAL		23 Mar 90	TMetals	TRG	ANTIMONY	60 4	UG/L		60	A	
SW097	SW097W05	SW	REAL		3 May 90	TMetals	TRG	ANTIMONY	60	UG/L	U	60		
SW097	SW097W06	SW	REAL	SW097W06	5 Jun 90	TMetals	TRG	ANTIMONY	60	UG/L	U	60		
SW097	SW00500W	SW	REAL	SW00500W	6 Jul 90	TMetals	TRG	ANTIMONY	60	UG/L	U	60		
SW097	SW00211W	SW	REAL	SW00211W	2 Aug 90	TMetals	TRG	ANTIMONY	21 2	UG/L	B	60		
SW097	SW00289W	SW	REAL	SW00289W	6 Sep 90	TMetals	TRG	ANTIMONY	27 7	UG/L	B	60		
SW097	SW00370W	SW	REAL	SW00370W	4 Oct 90	TMetals	TRG	ANTIMONY	26	UG/L	U	60		
SW097	SW00471W	SW	REAL	SW00471W	13 Nov 90	TMetals	TRG	ANTIMONY	22	UG/L	U	0 05	V	
SW097	SW00471W	SW	REAL	SW00471W	13 Nov 90	TMetals	TRG	ANTIMONY	22	UG/L	U	60		
SW097	SW00587W	SW	REAL	SW00575W	3 Dec 90	TMetals	TRG	ANTIMONY	30	UG/L	U			
SW097	SW00986W	SW	REAL	SW00986W	3 Apr 91	TMetals	TRG	ANTIMONY	25 6	UG/L	U	25 6		
SW097	SW01093W	SW	REAL	SW01093W	2 May 91	TMetals	TRG	ANTIMONY	25 6	UG/L	U	0 05	V	
SW097	SW80137W	SW	DUP	SW01196W	19 Jun 91	TMetals	TRG	ANTIMONY	11	UG/L	U	60	JA	12
SW097	SW80136W	SW	RNS	SW01196W	19 Jun 91	TMetals	TRG	ANTIMONY	11	UG/L	U	60	JA	12
SW097	SW80143W	SW	DUP	SW01299W	29 Jul 91	TMetals	TRG	ANTIMONY	42 2	UG/L	U	42 2	V	
SW097	SW80142W	SW	RNS	SW01299W	29 Jul 91	TMetals	TRG	ANTIMONY	42 2	UG/L	U	42 2	V	
SW097	SW01299W	SW	REAL	SW01299W	29 Jul 91	TMetals	DUP	ANTIMONY	42 2	UG/L	U	42 2		
SW097	SW01299W	SW	REAL	SW01299W	29 Jul 91	TMetals	TRG	ANTIMONY	42 2	UG/L	U	42 2	V	
SW097	SW01405W	SW	REAL	SW01405W	28 Aug 91	TMetals	TRG	ANTIMONY	42 2	UG/L	U	42 2	V	
SW097	SW80153W	SW	DUP	SW01405W	28 Aug 91	TMetals	TRG	ANTIMONY	42 2	UG/L	U	42 2	V	
SW097	SW80152W	SW	RNS	SW01405W	28 Aug 91	TMetals	TRG	ANTIMONY	42 2	UG/L	U	42 2	V	
SW097	SW01511W	SW	REAL	SW01511W	25 Sep 91	TMetals	TRG	ANTIMONY	14	UG/L	U	60	V	
SW097	SW01617W	SW	REAL	SW01617W	9 Oct 91	TMetals	TRG	ANTIMONY	15	UG/L		60	V	
SW097	SW70017ST	SW	REAL		17 Dec 92	TMetals	TRG	ANTIMONY	24 4	UG/L	U	24 4	JA	5
SW097	SW70026ST	SW	REAL	SW70027ST	25 Jan 93	TMetals	TRG	ANTIMONY	19 7	UG/L	U	19 7	V	
SW097	SW70027ST	SW	RNS	SW70026ST	25 Jan 93	TMetals	TRG	ANTIMONY	19 7	UG/L	U	19 7	V	
SW097	SW70031ST	SW	RNS	SW70030ST	26 Feb 93	TMetals	TRG	ANTIMONY	19 7	UG/L	U	19 7	V	
SW097	SW70031ST	SW	RNS	SW70030ST	26 Feb 93	TMetals	DUP	ANTIMONY	19 7	UG/L	U	19 7		
SW097	SW70030ST	SW	REAL	SW70031ST	26 Feb 93	TMetals	TRG	ANTIMONY	19 7	UG/L	U	19 7	V	
SW097	SW70046ST	SW	REAL	SW70050ST	24 Mar 93	TMetals	TRG	ANTIMONY	19 9	UG/L	U	19 9	V	
SW097	SW70046ST	SW	REAL	SW70050ST	24 Mar 93	TMetals	DUP	ANTIMONY	19 9	UG/L	U	19 9		

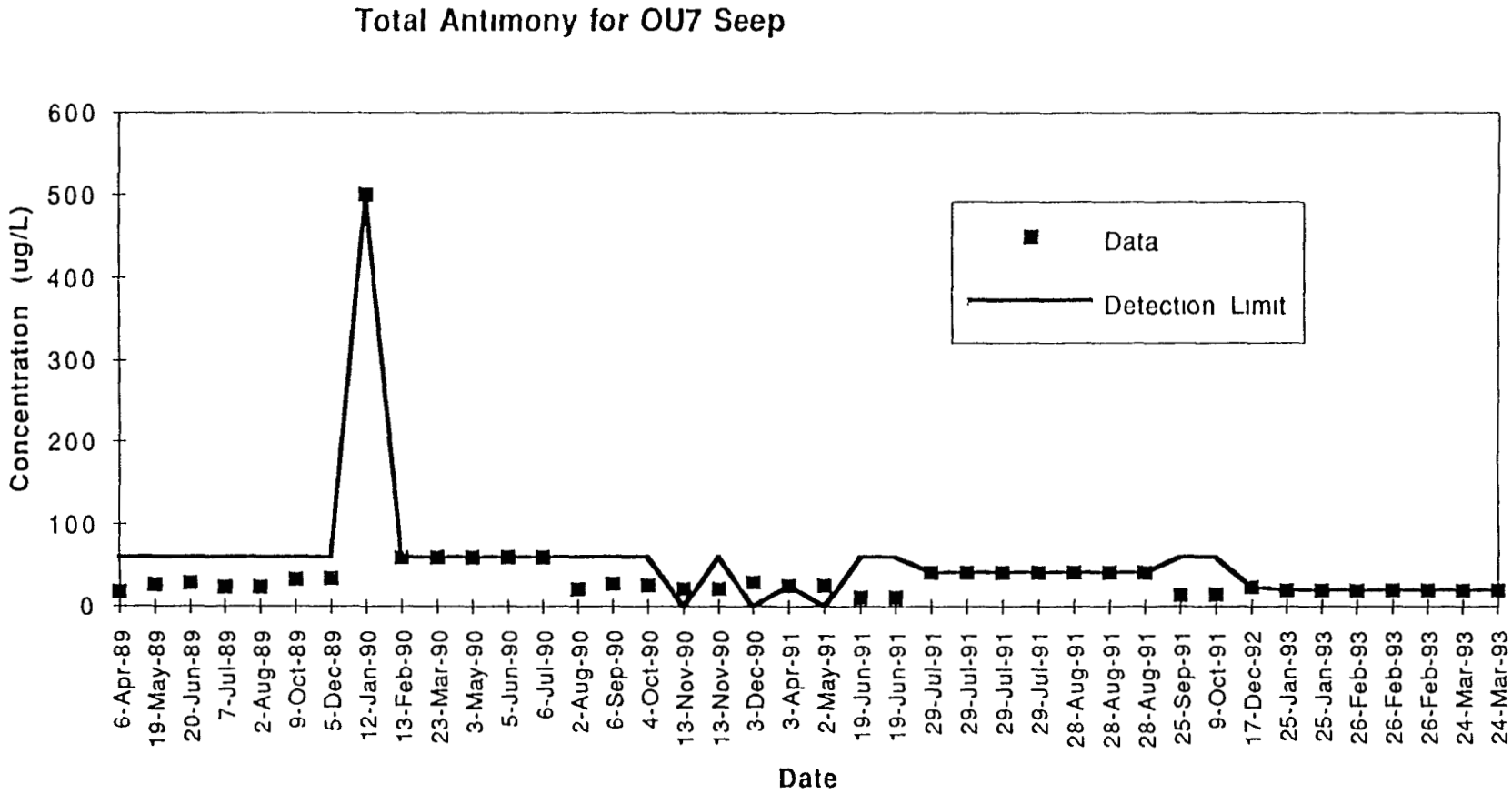

FIGURE 2-5

b1/b1